

Original
articleSexual behaviour among youths at high risk for
HIV-1 infection in Dar es Salaam, Tanzania

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Objectives: To investigate sex specific sexual behaviour in youths visiting a youth clinic for sexual and reproductive health in Dar es Salaam.**Methods:** A questionnaire was administered to a random sample of youths between 10 and 24 years of age attending the youth health clinic in Dar es Salaam. The clinical investigation included testing for syphilis and HIV-1 antibodies**Results:** 1423 youths attended the clinic between September 1997 and August 1998. The study population comprised 213 (53.5%) males and 185 (46.5%) females. 97 (24.4%) were below 20 years. The mean age at coitarche was 16.5 and 17.0 years of age for males and females, respectively. The coitarche was involuntary in 15 females (8.6%). 49.5% males reported more than five lifetime partners compared with 14.1% for females ($p < 0.0001$). Males reported recent partners to be 2.5 years younger, while females reported them to be 5.0 years older. No contraceptive use was reported by 29.7% of the males and 40.3% of females. 52.7% females had been pregnant and 26 (14.1%) reported induced abortions. Genital discharge was found in 69.5% and 73.9% and GUD in 36.6% and 27.1% of males and females respectively. 12 males (5.9%) and 43 females (24.6%) were found to be HIV-1 infected. 13.8% of the females with only one lifetime partner were HIV-1 infected compared with 40.9% with more than five partners ($p = 0.028$).**Conclusions:** Many youths in Dar es Salaam engage in sexual behaviours that put them at risk of unwanted pregnancies and STIs including HIV infection. Female youths were more likely to contract HIV infection than males. In African urban areas youth oriented clinics can have a pivotal role in HIV/STI prevention and control

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Introduction

The World Health Organization/UNAIDS estimated that during the year 1999 2.8 million people died of HIV/AIDS in the world, 2.2 million of whom were from sub-Saharan Africa; and 5.6 million people became newly infected with HIV, 3.8 million of whom were from sub-Saharan countries.¹ Young people are at higher risk for sexually transmitted infections (STIs) including HIV infection than any other age group.² The consequences of early HIV infection are both devastating for infected youths with the loss of many active years of life and to the entire society in that the infection spreads in the sexually most active group that for many years will fan the epidemic.

It is documented that STIs facilitate the transmission of HIV and that cure of symptomatic disease can reduce HIV transmission as demonstrated in Mwanza, Tanzania, with a low prevalence of HIV.³ However, that might not be the case in populations with a high prevalence of HIV.⁴ The situation among youth who are just initiating their sexual lives might be analogous to the situation in Mwanza.

Little is known about the sexual behaviour of urban youths in Tanzania. However, the age of initiation of vaginal intercourse, subsequent frequency of partner change, and use of different kinds of contraception are key factors for the understanding of the transmission of STI including HIV, and for the prevention of disease. Young females are more at risk for infection than males of a similar age.

The aim of the present study was to gather information on the sexual behaviour among youths attending a youth health clinic in Dar es Salaam.

Patients and methods

STUDY SET-UP

The youth health clinic (YHC) opened in September 1997 at the infectious disease clinic (IDC) near the central railway station at the centre of Dar es Salaam, a city of about 3 million inhabitants.

The YHC is open to all youths between 10 and 24 years of age.

The clinic was staffed with one medical officer, three clinical officers, three nurses, and one counsellor.

QUESTIONNAIRE AND DATA COLLECTION

A standardised questionnaire was filled in by the investigating clinical officer during the visit following informed oral consent.

CLINICAL INVESTIGATION

External genital examination was complemented with a speculum examination in females. Bedside light microscopy was not available. The diagnosis and treatment of the STIs other than HIV and syphilis was by a syndromic algorithm. HIV pretest and post-test counselling was given to all youths. HIV seropositive patients were given an appointment in 1–2 weeks for additional counselling and referral to an appropriate non-governmental organisation.

Table 1 Demographic characteristics the study population of youths with STIs in Dar es Salaam

	Males (n=213)		Females (n=185)		Total (p value)
	No	%	No	%	
Sex	213	53.5	185	46.5	398
Marital status					
Single	197	92.5	117	63.2	314 (p<0.0001)
Married monogamously	10	4.7	45	24.3	55 (p<0.0001)
Married polygamously	0		7	3.8	7
Cohabiting	4	1.9	8	4.3	12
Divorced	2	0.9	3	1.6	5
Widowed	0		1	0.5	1
Separated	0		2	1.1	2
Occupation					
Skilled labour	20	9.4	5	2.7	25 (p<0.001)
Petty trade	147	69.0	47	25.4	194 (p<0.0001)
Student	31	14.6	33	17.8	64
Jobless	11	5.2	45	24.3	56 (p<0.0001)
Housewife	—	—	50	27.0	50
Other	2	0.9	6	3.2	8
Adolescents	47	22.1	50	27.0	97 (NS)
Young adults	165	77.5	132	71.4	297

Table 2 Syndromic diagnosis

	Males, (n=213) (%)		Females, (n=185) (%)		Total
Syndromic diagnosis					
UDS	129	60.6	—	—	129
VDS	—	—	124	67.0	124
GUD	59	27.7	31	16.8	90
UDS+GUD	19	8.9	—	—	19
VDS+GUD	—	—	19	10.3	19
Syphilis	1	0.5	1	0.5	2
PID	0	0	2	1.1	2
Other	5	2.3	6	3.2	11
Counsel	0	0	1	0.5	1
None/missing	0	0	1	0.5	1

UDS = urethral discharge syndrome, VDS = vaginal discharge syndrome, GUD = genital ulcer disease, PID = pelvic inflammatory disease.

LABORATORY METHODS

All study patients were bled for syphilis and HIV-1 serology following informed consent. The sera were tested by the venereal disease research laboratory (VDRL) (Murex Biotech Ltd, Dartford, UK) test and if positive confirmed by *Treponema pallidum* particle agglutination (TPPA) (Fujirebio Inc, Tokyo, Japan) test. Testing for HIV-1 was by Behring plus HIV-1&2 ELISA (Behring Diagnostics GmbH, Marburg, Germany) and those found

to be positive were retested by Wellcozyme Recombinant HIV-1 ELISA (Murex Biotech Ltd, Dartford, UK). HIV-1 positivity was determined only if a sample was positive in both tests. All sera with discordant results in the two ELISAs were tested by western blotting.

STATISTICAL METHODS

EPI-INFO (6.04b) was used for analysis and statistical significance tests were performed by using Fisher's exact test or χ^2 values for categorical variables as indicated.

ETHICAL APPROVAL

The study has received approval from the research committee of the national AIDS control programme of the Ministry of Health in Tanzania.

Results

DEMOGRAPHICS

A total of 1423 youths attended the YHC between September 1997 and August 1998. Of these, 398 (28.0%) were randomly recruited into the study; 213 (53.5%) were males and 185 were females. For the purpose of this study, an adolescent is below 20 years, whereas a young adult is between 20 and 24 years of age. Forty seven (22.1%) and 50 (27.0%) were adolescent males and females, respectively (table 1). Most of the males were single, while many females were married or cohabiting (table 1), even female adolescents.

REASONS FOR ATTENDANCE

All males and 93.4% females said they attended the clinic because of "illness"; 10 females attended as contacts of males with STI. Most had a clinical complaint (see table 2).

The commonest source of information about the clinic for both males and females was a friend followed by the radio for both sexes, and sexual contacts for females.

SEXUAL HISTORY AND PRACTICE

The mean and median age at menarche was 14.9 (SD 1.54) and 15.0, respectively, while for spermatarche (the first, often nocturnal, ejaculation; balehe) it was 15.7 (SD 1.95) and 16.0, respectively. The mean age at coitarche was 16.5 (SD 2.56) and 17.0 (SD 2.01) for males and females, respectively.

Many youths, 24.9% of the females and 29.9% of the males, had early coitarche, below 16 years of age ($p = 0.30$) (table 3). The coitarche was reported to have been involuntary in 15 (8.6%) of the females. Six males and eight females reported to have been raped at the sexual encounter that they thought was the cause of the presenting symptoms.

One lifetime sexual partner was reported by 4.3% of the males and 20.9% of the females ($p > 0.0001$), while 49.5% of the males and 14.1% of the females had had more than five lifetime sexual partners ($p < 0.0001$). Adolescents of both sexes had a similar number of

Table 3 Sexual and contraceptive history of youths with STIs in Dar es Salaam

	Males, No (%)		Females, No (%)		Total (p value)
Early coitarche	63/211	29.9	44/177	24.9	107 (p=0.30)
Involuntary coitarche	3/200	1.50	15/175	8.6	18 (p<0.001)
Contraception (ever used)					
None	55/186	29.6	64/159	40.3	119 (p=0.04)
Condom	128/186	68.8	59/159	37.1	187 (p<0.0001)
Pills	8/186	4.3	20/159	12.6	28
IUD	0	0	2/159	1.3	2
Traditional	4/186	2.2	1/159	0.6	5
Sexual partners at present					
1	141/184	76.6	140/170	82.4	281 (NS)
2-5	42/184	22.8	29/170	17.1	71
6	1/184	0.5	1/170	0.6	2
Sex partners past 6 months					
1	80/200	40.0	107/171	62.6	187 (p<0.0001)
2-5	109/200	54.5	64/171	37.4	173 (p=0.001)
>5	11/200	5.5	0	0	11 (p=0.0001)
Sexual partners ever					
1	9/210	4.3	37/177	20.9	46 (p<0.0001)
2-5	97/210	46.2	116/177	65.5	213 (p=0.0001)
>5	104/210	49.5	25/177	14.1	129 (p<0.0001)
Type of sex practised					
Penile-vaginal	202/204	100	175/176	99.4	377
Penile-anal	7/204	3.4	9/176	5.1	16 (p=0.56)
Penile-oral	15/204	7.4	40/176	22.7	55 (p<0.0001)
Masturbation	18/204	8.8	0/176	0	18 (p<0.0001)

Table 4 HIV-1 and syphilis infection

	Males, No	(%)	Females, No	(%)	Total (p value)
HIV-1 seropositive/tested					
Total	12/203	5.9	43/175	24.6	55 (p<0.0001)
Adolescents	0/45	0	8/53	15.1	8 (p=0.007)
Young adults	12/158	7.6	35/122	28.7	47 (p<0.0001)
Early coitarche	4/62	6.5	13/43	30.2	17 (p=0.002)
1 lifetime partner	0/8	0	5/36	13.9	5
2-5	5/92	5.4	28/110	25.5	33 (p<0.0001)
>5	7/100	7.0	9/22	40.9	16 (p=0.0002)
Syphilis seropositive/tested					
Total	11/213	5.2	7/185	3.8	18 (NS)
Adolescents	4/48	8.3	4/53	7.6	8
Young adults	7/165	4.2	3/132	2.3	10
Early coitarche	6/63	9.5	3/44	6.8	9
1 lifetime partner	1/9	11.1	1/37	2.7	2
2-5	5/97	5.2	3/116	2.6	8
>5	5/104	4.8	3/24	12.5	8 (NS)

partners over the past 6 months, while the older males had significantly more partners than the older females (p<0.001).

Males reported that their partners at coitarche were younger with a mean of 0.7 (SD 2.0) years, while females reported their male partners to be older, the mean being 5.3 (SD 5.1) years at coitarche (p<0.001). At the sexual intercourse that could have led to the presenting complaints, males reported that their female partners were on average 2.5 (SD 3.2) years younger and females reported that their male partners were on average 5.0 (SD 5.0) years older (p<0.0001).

Penile-oral sex was reported by 7.4% of the males and by 22.7% of the females (p<0.0001) and penile-anal sex by 3.4% and 5.1% of males and females, respectively (p = 0.56). Only 18 (8.8%) males reported masturbation (table 3). Homosexual practice was reported by 2.3% of the males and 2.9% of the females (data not shown).

CONTRACEPTIVE USE

Many, 29.7% of the males and 40.3% of the females, claimed to have never used any contraceptive method (p = 0.04); 68.8% of the males and 37.1% of the females (p <0.0001) (table 3) reported condom use for contraception.

PREGNANCY AND ABORTIONS

Ninety six (52.7%) females reported to have ever been pregnant while 44 (24.1%) said they had had abortions. Twenty six women had had repeated abortions.

CONDOM USE

Over all, 69.3% and 68.8% of the males had ever used condoms for prevention of STIs and contraception, respectively. The corresponding figures for females were 60.3% and 37.1%, respectively. Condom use was 42% among those who reported one sex partner and 71% in those who had more than five partners (p = 0.0015).

Only about 10% of the youths, regardless of sex or age at coitarche, reported to have used a condom during the sexual encounter that they suspected had led to the presenting problem (data not shown).

DIAGNOSIS OF STI SYNDROMES

Most youths had syndromic diagnoses implicated in facilitating HIV transmission. In males urethral discharge syndrome (69.5%) and genital ulcer disease, GUD, (36.6%) were common. In females most had the corresponding syndromes, vaginal discharge syndrome (73.9%) and GUD (27.1%). Only two female youths were found with no STI syndrome (table 2).

HIV-1 INFECTION

Forty three (24.6%) females and 12 (5.9%) males were found to be HIV-1 seropositive (p<0.0001) (table 4). No male and 15.1% of the female adolescents (p = 0.007) was HIV infected. There was no statistically significant correlation between age at coitarche and risk for HIV-1 infection.

In females with only one lifetime partner, 13.8% were infected, compared with 40.9% of those with more than five partners (p = 0.028). In females, there was a positive association with the length of sexual activity and HIV-1 seropositivity (mean 5.1 versus 3.4 years, p = 0.0098) and also with the total number of sexual partners (p<0.052).

Among ever married or cohabiting females, 21.0% were HIV seropositive, compared with 27.0% of the single females (p = 0.483).

In males, there was no significant difference in length of sexual activity (6.0 versus 4.7 years) and HIV-1 seropositivity (p = 0.07), nor with the number of sex partners.

HIV-1 seropositive females did not have coitarche with significantly older men (mean age difference 6.2 (SD 7.3) years) than seronegative females (mean age difference 5.0 (SD 4.2) years), nor did they have significantly older male partners at the latest sexual intercourse suspected to have caused the presenting infection (mean age difference 4.5 (SD 6.4) versus 4.9 (SD 4.1) years).

There was no association between oral or anal sex and HIV-1 seropositivity (p = 0.64 and p = 1.0, respectively).

Genital ulcers were found more often in seropositive males, 8/12 (66.67%), and females, 18/43 (41.86%), than in seronegative males, 65/191 (34.03%), and females, 28/132 (21.21%), p = 0.03 and p = 0.001, respectively.

None of the studied had antibodies against HIV-2.

SYPHILIS

There was no statistically significant difference in prevalence of active syphilis between females (3.8%) and males (5.2%), or between females and males who were adolescents (7.6%) and (8.3%) or who had had early coitarche (6.8%) and (9.5%) respectively (table 4). Males with active syphilis had had an earlier coitarche (mean 14.9 (SD 3.0) years) compared with males without it (mean 16.6 (SD 2.5) years) (p = 0.02), while there was no difference among the females. There was no significant statistical difference in the number of years of coital activity in those with or without active syphilis in either sex, nor was there a correlation with the number of sex partners in males. However,

females with six or more partners had an increased risk of contracting syphilis (12.5% compared with 2.6%) ($p = 0.046$).

Eleven males and five females reported to have had a previously diagnosed STD and that was not predictive of current syphilis or HIV.

There was no association between oral or anal sex and syphilis.

Six of the 377 (1.6%) youths had both HIV-1 and active syphilis ($p < 0.055$).

Discussion

The fact that the YHC attracted 1423 youths in its first year of existence is a positive finding. The high prevalence of STD syndromes demonstrates the need for youth friendly services. The acceptability of the clinic was evidenced by the frequent reports that youths had heard about the clinic through friends. Since many of females were married or cohabiting and had already started their reproductive life a youth clinic in Dar es Salaam has to take this into account.

The findings cannot be generalised to all youths in Dar es Salaam but are limited to youths who had genital symptoms were motivated to seek medical care at a STD clinic. Despite the sensitive nature of the questions the response rate was very high.

All male youths and all but two female youths had one or more STI diagnoses by the syndromic approach which are associated with increased risk of HIV transmission.^{5,6}

It is particularly disturbing that GUD was found in many youths (36.6% and 27.1% of the males and females, respectively).⁷ However, despite the high prevalence of STI in this population, only 11 males and five females reported that they were aware of a previous STI.

Postponing initiation of sexual intercourse has been advocated as a means to halt HIV transmission. The mean age at coitarche of 16.5 and 17.0 years for males and females, observed in this study compares very well with what has been demonstrated by others in a variety of countries⁸ and does not indicate that this heavily infected population started to have sexual intercourse at an earlier age than age mates in other countries. Nor is it evident that those who started to have sex at 15 years of age or younger were at higher risk in this population.

Partner change is an important factor in the transmission of STI/HIV. There was a considerable potential for STI transmission since more than 50% of the males and females had had more than one partner over the past 6 months and 23% of the males and 17% of the females reported an ongoing relation with more than one partner. The observation that 40.9% of females with five or more partners were HIV infected underscores vulnerability of young women. Despite the high prevalence of STDs only 10% of the youths reported to have used a condom during the sexual encounter that was suspected to have caused the current problem.

Monogamy is often advocated to reduce the transmission of STI/HIV. Of the females with

only one lifetime sexual partner, 13.8% were HIV-1 seropositive, indicating that their first sexual partners infected them. It is proposed that adherence to one partner in marriage is protective for STI/HIV. However, marital status was neither protective nor imposed a special risk of HIV infection among young females.

The most appalling finding in this study is that in this young age group, 24.6% and 5.9% of the females and males, respectively, are already HIV-1 infected. A similar sex discrepancy was found among schoolchildren in northern Tanzania.⁹ The higher infection rate in the females observed in this study is particularly remarkable in that they were less sexually experienced and had considerable fewer sexual partners than their male counterparts. These findings clearly indicate that young females are more vulnerable to HIV-1 infection than males. The reason for this has been attributed to the increased susceptibility of the female, which however was not substantiated in the Rakai study where HIV transmission was the same regardless of the sex of the first infected in discordant couples.¹⁰ It is probable that HIV-1 infection is spread into this young population of females by older males as the females reported the age difference between them and their sex partners at coitarche to be 5.3 years and at the latest sexual intercourse to be 5.0 years, while males reported that the age difference at coitarche to be on average 0.7 years and as at the latest sexual intercourse 2.5 years. This finding is in concordance with other studies from sub-Saharan Africa.¹¹ In this study there was no indication that much older men, "sugar daddies," transmitted HIV to young females.

This study demonstrates that youths at high risk for HIV can be reached and that there are great needs for counselling, provision of condoms/contraception, and STI services in this population.

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